

Aquarium Notes and News

SEPTEMBER, 1914



Issued by the
**AQUARIUM SOCIETY OF
PHILADELPHIA**

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THE Aquarium Society of Philadelphia meets on the fourth Wednesday of each month, except July and August.

Initiation fee, \$1.00; dues, \$1.80 per year.

Corresponding membership, \$1.00; no initiation. "Notes and News" is sent to all members.

We have no subscription list and no paid advertisements, but members may use these columns, subject to editorial approval, to tell what they want to buy or sell.

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PROGRAM OF SEPTEMBER MEETING

Wednesday, Sept. 23d, 1914, 8.30 P. M.

This is our annual meeting. We will have a report of the various officers and also election of officers and board of governors. We trust that our members will come out, so we may have a good meeting to start for the new year.

Sale and Exchange of Fish

At the September meeting it is the usual custom for our different members to bring to the Society the fish of which they would like to dispose, either by selling or exchanging. We hope as many as possible will bring out those fish of which they have too many.

Novice Class Competition

The best fish of any class exhibited by any member who has never won a blue ribbon will be awarded the H. P. Peters cup.

AQUARIUM NOTES & NEWS

AWARDS OF THE JUNE MEETING

At the meeting in June there was an exhibit of fish other than Gold Fish, and we never had in the history of the Society a larger exhibit, or one of such high class. The Blue Ribbon was carried off by Mr. William Paullin, as his exhibition was, by far, the largest and best of any of our members. There were also exhibitions by Mr. William Innes, Jr., Mr. George W. Price, Mr. John W. Palmer, Mr. L. M. Dorsey, Mr. Franklin Barrett, Mr. C. A. Provost, all of whom received a red, white and blue ribbon.

PUBLIC EXHIBITION

The Joint Committee, for a proposed public exhibition of fishes and aquaria, has held a number of meetings, and is now prepared to submit recommendations to the Societies for their consideration.

The Fairmount Park Commissioners have allowed us the use of Horticultural Hall in Fairmount Park. This is an ideal place for such an exhibition, and it is up to every member to do something towards making it such a success that we can at a future time go back to the Commissioners and ask for the same privilege again.

Thousands of people will be in attendance, for we would not only reach the regular weekly visitors, but we expect the newspapers to give us considerable space.

The most suitable time for the exhibition seems to be October 3d, 4th, 5th. It is hoped there will be a meeting on Saturday, October 3d, for the purpose of organizing a Federation of American Aquarium Societies, as we will have representatives of most of the Societies with us at that time.

If the Committee's plans are carried through, there will be an informal dinner Saturday evening, October 3d.

It is hoped that the attendance at the forthcoming September meeting will be large, in order that the different points may be thoroughly discussed, and that there may be as many helpful suggestions as possible.

Remember, too, that it is election night, and that there are two prizes to be awarded—the Peters cup for the novice class and the Lippincott cup for the first successful breeding of the *Chaetodon*.

LIPPINCOTT CUP

In the issue of the Notes and News, dated April, there was an offer made by our President, Mr. Lippincott, of a cup to the first member of our Society who succeeded in raising and exhibiting *Mesogonistius Chaetodons*. Mr. Price will exhibit at our September meeting the fish which he has raised and their parents. At the same time we are sending in the name of the Philadelphia Aquarium Society to the Smithsonian Institution at Washington the article published herewith on the breeding of this fish. By complying with all the regulations in regard to the cup, Mr. Price will receive at the October meeting the cup which has been offered, and we also wish to state here that he is the first person in the United States who has been able to raise this fish in captivity, and in this way furnish the Smithsonian Institution at Washington with the complete account of the fish, its home and its breeding habits.

MESOGONISTIUS CHAETODON

An Account of Its Breeding and Other Habits

W. P. SEAL

This species, the only one of the genus, is one of the smallest as well as being one of the most beautiful and mild mannered of the

Centrarchidae or sunfish family. The name *Chaetodon* popularly given to its properly belongs to it as its specific name, being so-called because of its general outward resemblance to the family *Chaetodontidae*; these, however, being tropical sea fishes. It deserves the distinction because of its beauty and gentle character. The name black-banded sunfish is long and commonplace. The objection that the name *Chaetodon* is borne by a family of sea fishes has as little force as would an objection to the name sunfish, because there are sunfish in the sea.

While the species has been known at least sixty years, until recently very little had been learned regarding its habits. Its known range, which was for many years limited to the state of New Jersey, was later extended to Maryland, and still later to North Carolina. It is rarely found outside of red or black water—what is known as cedar swamp or cypress swamp water—though these conditions are, no doubt, merely an accident and not a necessity of its existence.

There is hardly room for doubt that they can be found in waters of this character at least as far south as Florida, and probably also in the bays of the Gulf Coast. I have only found it in one place in Pennsylvania, and that a tributary of the Delaware River, where, at one time, it was abundant.

Its habits of life are such that even where it is very abundant it might not be found at all by one not properly provided with the means of taking it and knowing where to look for it. Though the various species of the family in general are noted for their pugnacious dispositions, the *Chaetodon* is so mild mannered as to appear timid by contrast—not at all like a carnivorous species. The contrast in this respect to the two somewhat smaller species of *Enneacanthus*, *obesus* and *gloriosus*, with one or both of which it is always found associated, is very great. In the Aquarium, therefore, the *Chaetodon* is quite harmless to goldfish or other soft-rayed fishes, except to some extent when under the influ-

ence of sexual excitement, and then, possibly, only with the older and larger individuals. I was once told of a case where one had torn the eye out of a goldfish, a story which at the time I disbelieved, but later having witnessed a savage attack by one under similar stress, I was compelled to reverse my opinion. Pugnacity in the breeding season is, however, an universal characteristic.

The natural food of this species is probably almost wholly the worm-like larvae of dipterous insects, as these are more abundant than any other low forms of life in masses of plants in stagnant water. Of course, there are some young of other forms, such as beetles and dragon flies, and crustaceans, such as *gammarus* and *assetus*, and possibly some copepods, such as *cyclops* and *daphnia*, though these latter are scarce where fishes abound. In the aquarium they will eat most living things that they can swallow easily. They are very suspicious and will approach an object and examine it carefully before attempting to eat it, even when very hungry. Small water beetles they will not touch. They eat mosquito larvae with avidity, but do not care much for the pupae. Being timid, possibly the grotesque mask frightens them. Most, and perhaps all of the other sunfishes will gorge themselves with food until there is a very perceptible distension of the abdomen, but, whether taken from nature or in the aquarium, except the females when gravid, they never look as though they were well fed. Dead food, such as minced oyster, mussel or earth worm, or any of the prepared foods of animal nature, they will come by degrees to eat sparingly, but on such foods they will never breed. They will simply eat enough to preserve life for a time.

It is well known to all fish breeders that an abundance of acceptable food is the fundamental requirement in bringing about the spawning of fishes; not simply the quantity necessary to keep them alive and in health, but also that necessary in addition to stimulate the generative instinct and processes.

Though the *Chaetodon* has been a familiar aquarium fish for half a century and was exported to Germany many years ago, it is only in the present year that any record of their breeding habits has been made, so far as I am aware. An article by Mr. F. Schubert, appearing in the German Magazine "Blaetter" of March 3d, 1914, and reproduced in Aquarium Notes and News for April, 1914, gives an interesting account of the breeding habits of this species.

Regarding Mr. Schubert's description of sexual coloration, I can only say that I have never been able to satisfy myself as to their sex, except by the distension of the female when gravid. I have never been able to discern any difference in shape or color, and I have caught them in their breeding season, some females being very dark and others very light and tinged with yellow. Some of those that were evidently males were likewise black and some quite light, with the yellowish tinge. Judging by analogy, it would be expected that the male would be the one more distinctly marked with bands or heightened color at this season, but, as Dr. Theodore Gill has pointed out ("A Plea for the Observation of the Habits of Fishes, and Against Undue Generalization," "Pro. of 4th Int. Fishing Congress"), we cannot safely generalize concerning such matters.

The natural habitat of the *Chaetodon* is the sluggish or stagnant part of creeks or ponds where there are dense masses of plants, and among these they have their preferences, some of them probably affording better protection or more abundant food supplies. At all events, the seeker after them may search a long time before he finds their favorite haunts. In winter they will be more closely segregated and will, of course, be at or near the bottom, while in spring and summer they will be near the surface, where it is warmer.

Because of its habit of living in dense masses of plants, with a thick, soft, sedimentary deposit beneath, it has always appeared to me probable that they spawned on

plants, but until the present summer there has been no certainty of this.

Mr. George W. Price, of the Philadelphia Aquarium Society, has been fortunate enough to have had several nests made in his aquarium by Chaetodons, which, while in part seeming to confirm the observations of Mr. Schubert, have been found in the main to be found to spawn on plants, thus again emphasizing Dr. Gill's caution against "Undue Generalization." Mr. Price had one pair of fish to spawn five times, June 5th, 16th and support my expressed belief that they would 19th, and July 11th and 15th. The usual spawning season is the latter part of May and early part of June, but in this case it was retarded by the changed conditions. No fish resulted from the first, second and fourth spawnings. Of the third lot, some of the eggs were removed and placed in a jar, where they hatched on June 21st. Of the fifth spawning, July 15th, about half of the eggs were transferred to a jar, where they hatched on the 17th.

The nest is usually made in the denser part of a mass of plants, and is simply a hollow fashioned out by the male forcing itself around and around until a place large enough to hold the two fish is formed. On the plant on the lower part and sides of this hollow the eggs are deposited.

The act of spawning, Mr. Price describes as follows: After several attempts the male succeeded in inducing the female to follow to the nest. Following the usual sidewise undulatory movements common to the other sunfishes, the fish came together somewhat in the shape of a butterfly when resting on a leaf with wings moving back and forth, thus forming an acute angle, varying probably from five to forty degrees. With this there was also the characteristic quivering motions common to fishes that are not in motion when spawning. When the spawning was completed the female was driven out, and thereafter kept away from the nest. The fish were hatched in two days, on June 21st, upon which they

dropped to the bottom of the tank and stood on their tails in a cluster directly under the nest. They were then only about one-eighth of an inch long. By the 26th they had started to swim. From the 22d they were fed on dried lettuce leaf and fine *daphnia*, but as all young fishes of oviparous species are provided with a yolk sac, from which they derive sustenance while undergoing the earliest stages of development, it is probable that the dried lettuce did no more than provide food for the development of infusoria and for the *daphnia*, all of which later became available for the young Chaetodons. In a week's time the fish had increased to a length of about three-eighths of an inch. By July 20th the black and red markings on dorsal and ventral fins were plainly discernible. By July 25th, when five weeks old and half an inch long, they were perfect reproductions of adults.

The plants in which the nests were made were the roots of the water hyacinth and *Myriophyllum*. In addition to the nests in the plant masses, some hollows were fanned out in the sand and gravel, but it was found that this was done to uncover the fine fibrous roots of plants like *Valisneria* and *sagittaria*, on which to deposit the eggs. It is quite possible that a closer examination would have shown this to be the fact in Mr. Schubert's case, as he refers to *Valisneria* as the plant used and preferable for the purpose. On the other hand, it is quite possible that in the absence of the roots they might have spawned on small stones or whatever solid substance might have been present. I once had a species of *Enneacanthus* to spawn on the glass of an aquarium, the eggs being plastered in a single layer, just as they are deposited by the common sunfish, *Eupomotis Gibbosus*.

It is also possible that the younger and smaller individuals of the larger species may also spawn on plants and that the "pot-nests" are only made by the older and larger ones. These, however, are only suggestions for future observation.

Later Mr. H. R. Lippincott was also fortu-

nate enough to have a nest built in a wooden tank, but, unfortunately, where chances for observation were limited. He says, "They hollowed out a cup-shaped space in a mass of very fine *Utricularia*, arranging it just below the surface and making it about 2½ inches in diameter, with an opening in the bottom through which they made their entrance and exit. After the eggs, which were much like goldfish eggs, except for their uniform crystal whiteness, were deposited, one of the fish seemed to be almost constantly with them, and when disturbed would dart quickly through the hole and into hiding." This was undoubtedly the male fish. Very unfortunately, at this time, Mr. Lippincott was obliged to be away from home, and so was unable to make further observations and is not sure whether or not any of the young are in hiding in the darker recesses of the tank.

In published papers I have quoted Dr. Theodore Gill as saying to me that "It is a shame that we know so little of our commonest fishes." I once delighted Dr. David Starr Jordan by showing him two species of darters spawning in aquaria, he being especially interested in that group of fishes.

I introduce these two incidents here as a text for a few remarks offered in the hope of inspiring greater efforts on the part of our fanciers in the investigation of the habits of our native fishes. We are far behind the Germans in this respect and are engaged principally in observing species whose habits they have already described, the *Chaetodon* being one of them.

To any one who desires a pleasant pastime for their leisure hours, or for a mental stimulus, nothing can have a greater interest than a study of living things, and especially of the denizens of that more hidden and mysterious realm, the waters.

It is not too much to say that all the great aquaria of the world, costing large sums of money for erection and maintenance, and most of them being adjuncts to great biological laboratories, do not achieve any of the results

common to the aquarium fanciers of the world.

They have not even acquired that fundamental knowledge necessary to the successful holding of fishes in captivity in healthful condition, to say nothing of inducing the exercise of the generative instinct. Menageric methods prevail, and but for constant renewal at great expense, their tanks would be empty.

SAND, SOIL, GRIT OR PEBBLES?

Considerable discussion has been evoked at meetings of the Aquarium Society of Philadelphia, by the important query "What is the best planting medium in the fresh water aquarium, sand, soil, grit or pebbles?" At first a divergence of opinion was expressed, but later experimentation led to an almost unanimous concurrence in what was since adopted as the best practice.

Some desirable aquatic plants, *sagittaria*, *Vallisneria*, *anacharis*, *cabomba* and *nitalla*, will thrive and exhibit paler green leaves when set directly in the sand; but other plants, *ludwigia*, *potamogeton*, *moneywort* and *water-poppy*, require soil to continue their growth and to survive under the changed conditions.

The best practice, it has been found, is to place a two to two and one-half inch layer of thoroughly washed bar or beach sand in the aquarium, into which shallow dishes or pots containing clean turf and the last-mentioned plants are arranged, then those to be planted directly in the sand introduced, and the whole surface covered with a one-inch layer of small beach pebbles, known as grit. A few larger pebbles or brookworn stones may be scattered over the surface to produce a natural effect.

For the marine aquarium mixed sand and grit is preferable, as it offers the best medium in which some of the animals may follow their natural habit of burrowing and hiding.

Grit permits the finer particles of humus to sift through to the sand layer, to serve as

nourishment for the plants, presents a neat and tidy surface appearance, and a firmer layer for the siphoning of the excess accumulations.

We are anxious that the future issues of the Aquarium Notes and News should contain articles from our members. We are particularly interested in original work, and we hope that all our members will make it a point to send us their articles from time to time, so that we may give to our other members the benefits of each other's experiences.

It may seem to you when you have done some work with the aquarium, or with your fish, that it is not out of the ordinary, but it frequently happens that things which you have known for years are not known to others, and for this reason, we suggest, if you yourself will not write an article, that you will mention the work that you are doing to the editor so that he may incorporate it in some other article.

We expect to have a future edition of our paper on the Feeding of Fishes, and if you have any special thought on the subject, please send it along to us so that we may use it in a coming issue.

A MARINE AQUARIUM

Some of our members have been giving thought to the establishing of marine aquaria. So far, one has been started. This is now stocked with sea shrimp. These little animals are very interesting in their habits and movements. At present they are feeding on daphnia. Although this is a cultivated taste with them, they now eat them with apparent relish.

Members and their friends will be welcome to see the aquarium at 135 North Twelfth Street.

